Obstructive Sleep Apnea (OSA) as a Risk Factor

Prof. Pham Nguyen Vinh, MD, PhD, FACC
Pham Ngoc Thach Medical University
Tan Tao Medical University
Tam Duc Heart Hospital
HCM Heart Institute

Prevalence of OSA

- OSA:
  - Recurrent episodes of complete (apnea) or partial (hypopnea) upper airway obstruction
  - 34%/middle-aged males

    17%/middle-aged females
- OSA: 40 – 80%/patients with HTN, HF, coronary heart disease (CHD) and cerebrovascular disease

Sources: Peppard PE, et al. Am J Epidemiol (2013); 177:1006-1014
Javaheri S, et al. J Am Coll Cardiol (2017); 69(7):841-858

Diagnosis of OSA

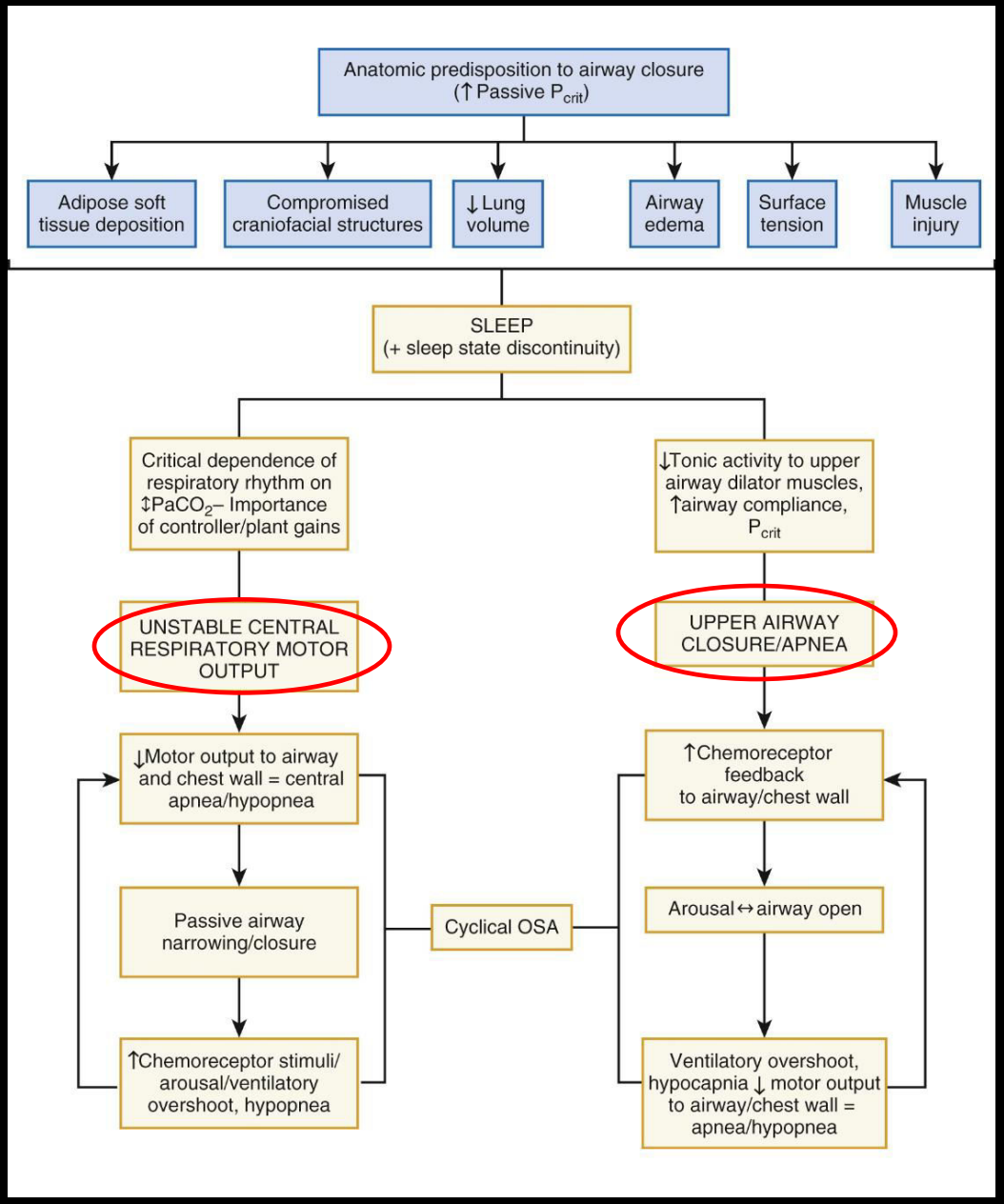
1. Symptoms of breathing disturbances during sleep: snoring, gasping, breathing pauses
2. AHI ≥ 5 (Apnea – Hypopnea Index)

Or

AHI > 15 without symptom

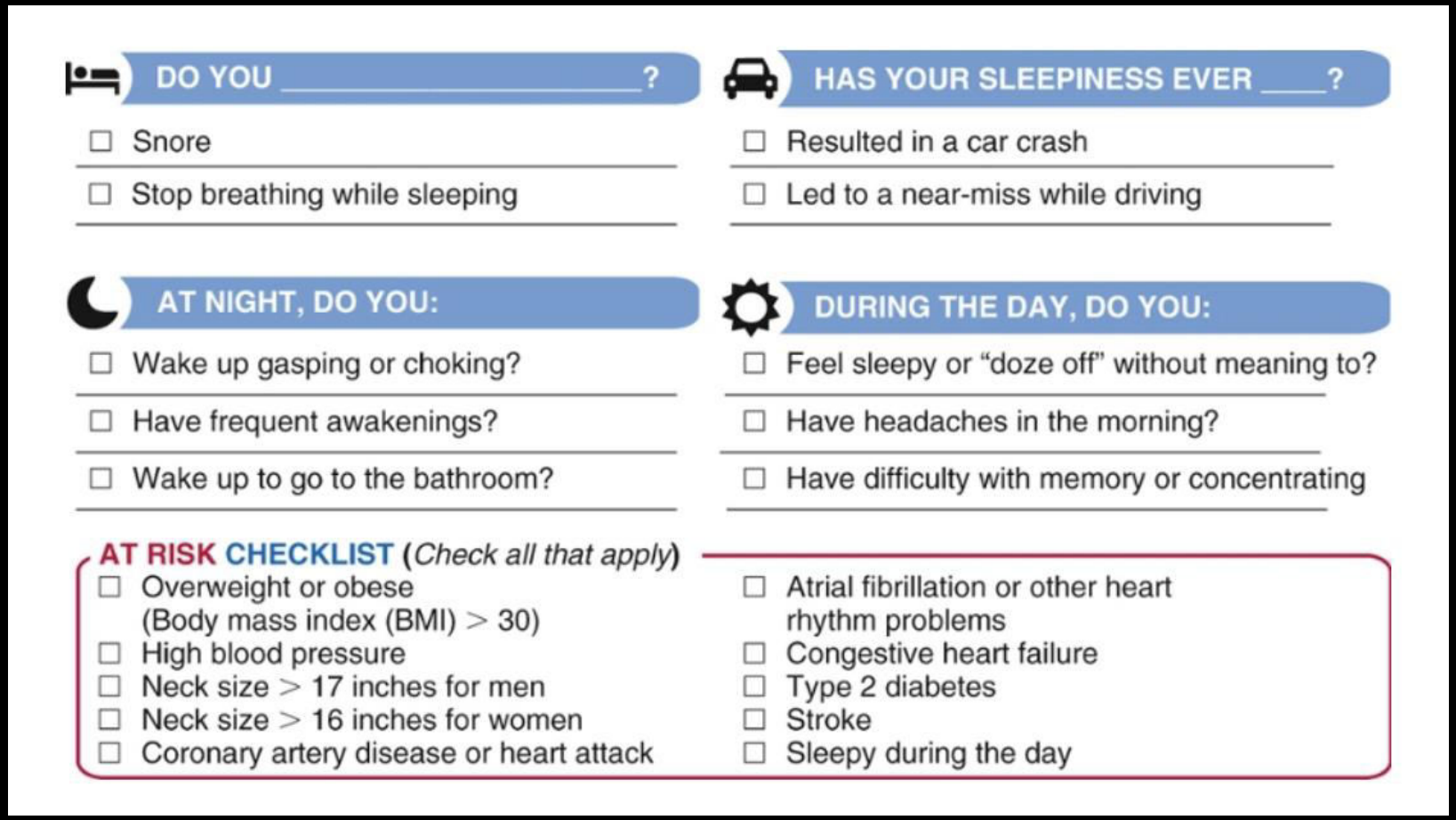
Source: Sateia MJ. Chest (2014); 146(5):1387-1394

Pathophysiology of OSA



Source: Dempsey JA, et al. Physiol Rev 2010;90:47-112

Screening questions for Sleep Apnea



DO YOU _____?

- ☐ Snore
- ☐ Stop breathing while sleeping

HAS YOUR SLEEPINESS EVER ____?

- ☐ Resulted in a car crash
- ☐ Led to a near-miss while driving

AT NIGHT, DO YOU:

- ☐ Wake up gasping or choking?
- ☐ Have frequent awakenings?
- ☐ Wake up to go to the bathroom?

DURING THE DAY, DO YOU:

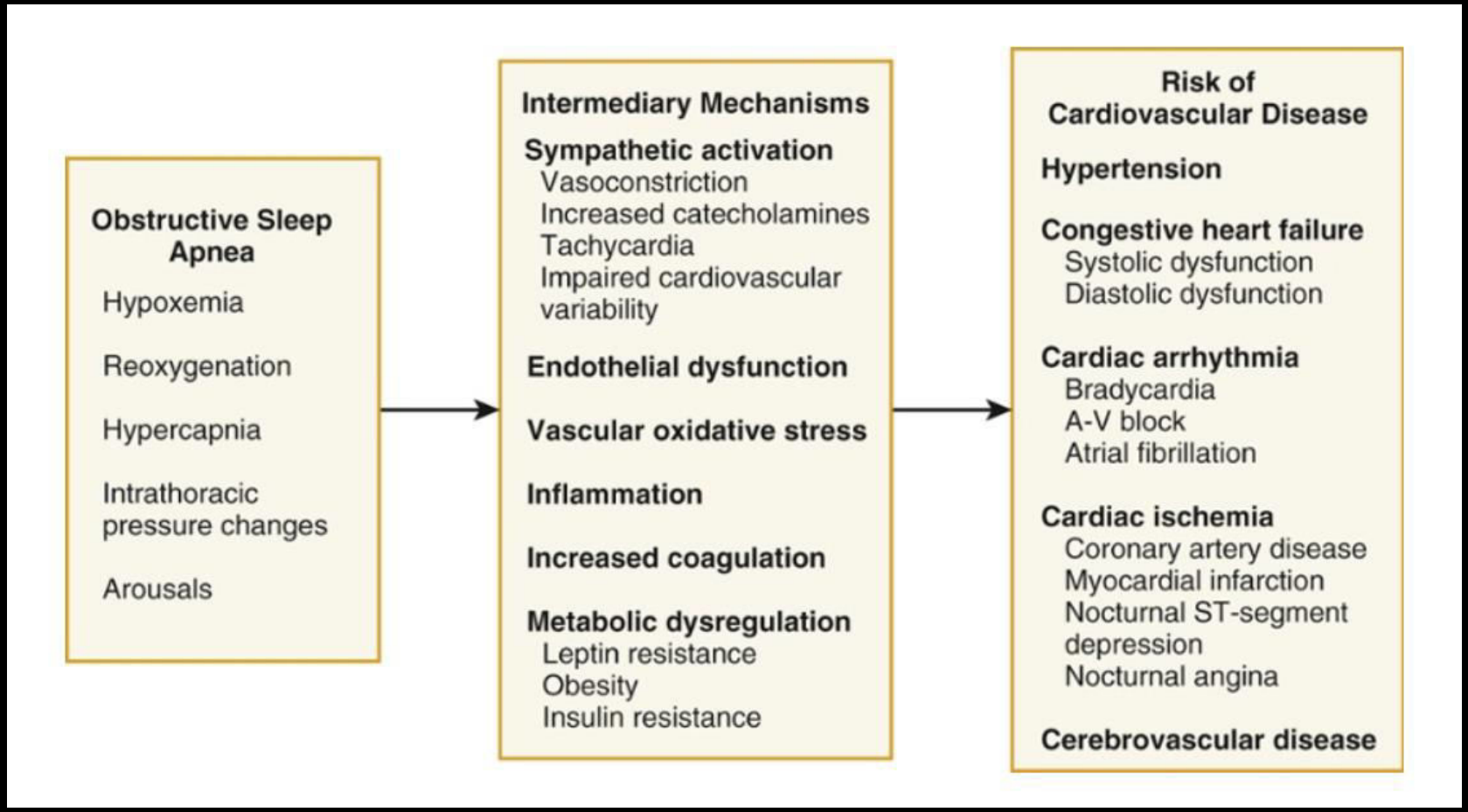
- ☐ Feel sleepy or "doze off" without meaning to?
- ☐ Have headaches in the morning?
- ☐ Have difficulty with memory or concentrating

AT RISK CHECKLIST (*Check all that apply*)

- ☐ Overweight or obese (Body mass index (BMI) > 30)
- ☐ High blood pressure
- ☐ Neck size > 17 inches for men
- ☐ Neck size > 16 inches for women
- ☐ Coronary artery disease or heart attack
- ☐ Atrial fibrillation or other heart rhythm problems
- ☐ Congestive heart failure
- ☐ Type 2 diabetes
- ☐ Stroke
- ☐ Sleepy during the day

Source: American Academy of Sleep Medicine. www.sleepeducation.org/docs

Pathophysiologic consequences of OSA



Source: Shamsuzzaman ASM, et al. JAMA 2003;290(14):1906-17

OSA and Hypertension (1)

- OSA exists in:
  - 30% of essential hypertension patients
  - 80% of resistant HTN patients
- 50% of OSA patients have HTN

Sources: Pedrosa RP et al. Hypertension (2011);58:811-817
Phillips CL, et al. Nat Sci Sleep (2013);5:43-52

OSA and Hypertension (2)

- CPAP (Continuous positive airway pressure) mainstay therapy for OSA
- Meta-analysis: CPAP reduces 2-3 mmHg SBP and 1.5 – 2 mmHg DBP
- Meta-analysis of 6 studies on resistant hypertension: CPAP reduces 7.2 mmHg SBP and 5 mmHg DBP

Sources: Gottlieb DJ, et al. N Engl J Med (2014);370: 2276-2285
Iftikhar IH, et al. J Hypertens (2014);32:2341-2350

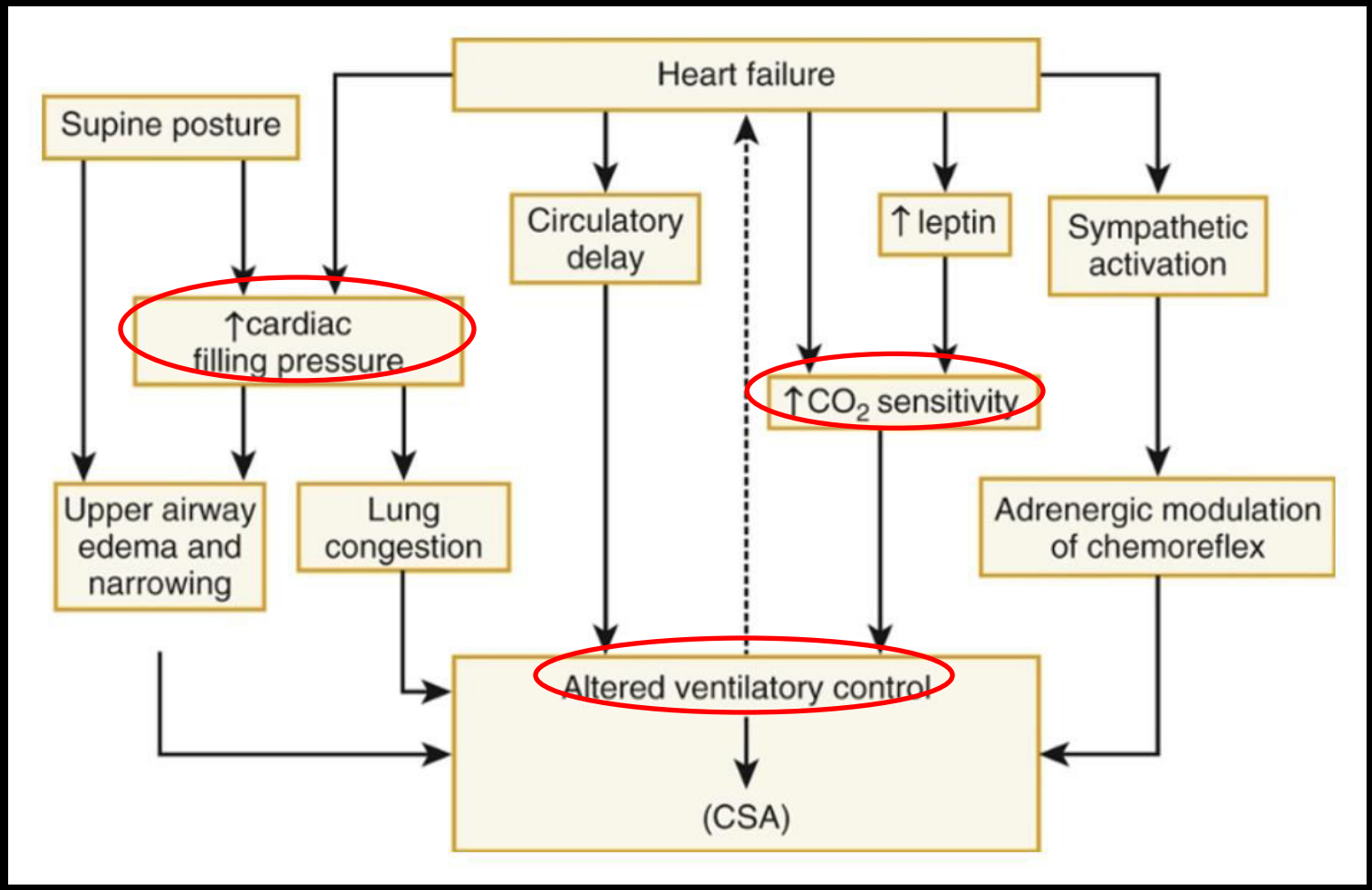
Hypertension guidelines: OSA is a prevalent and modifiable cause of systemic hypertension

Source: Chobanian AV, et al. Hypertension (2003);42(6):1206-1252

Sleep – Disordered Breathing (SDB) and Heart Failure

- SDB:
  - OSA
  - CSA (Central Sleep Apnea)
- CSA: most common SDB in HFrEF
- OSA: most common SDB in HFpEF

Possible mechanisms of CSA and exacerbation of heart failure



Source: Somers VK, et al. Circulation (2008);118(10):1080-111

Relationship between SDB and HF

- OSA: 60% increased 8-year incidence of HF
- CSA or Cheyne-Stokes respiration: 2 – fold increased incidence of HF

Source: Javaheri S, et al. Am J Respir Crit Care Med (2016);193:561-568

The SERVE - HF trial

- 1,345 patients with symptomatic HF; EF < 45% and moderate to severe CSA
- Adaptive servoventilation (ASV): 34% increase in CVD mortality rates

Source: Cowie MR, et al. N Engl J Med (2015);373:1095-1105

OSA and Cardiac Arrhythmias

- OSA: ventricular and atrial arrhythmias
- Moderate to severe OSA (AHI ≥ 25): 2 to 4 - fold increased risk of nocturnal arrhythmias
- ORBIT-AF study: 18% of 10,132 patients with atrial fibrillation had an OSA diagnosis

Source: Mehra R, et al. Arch Intern Med (2009);169:1147-1155
Holmqvist F, et al. Am Heart J (2015);169:647-654

OSA as an atrial fibrillation risk factor

- Meta-analysis: CPAP use in OSA patients reduces the atrial fibrillation risk by 44%
- CPAP treatment: decreases recurrence rate of Afib after electrical cardioversion
- Consensus: OSA is an Afib risk factor

Source: Qureshi WT, et al. Am J Cardiol (2015);116:1767-1773
Estes 3rd NA, et al. Circulation (2011); 124:363-372

Conclusion

- SDB: highly prevalent in HTN, CHD, HF, atrial and ventricular arrhythmias and stroke
- Treatment of OSA: improve BP, EF, ventricular ectopy, recurrent rate of Afib and improve quality of life
- OSA: risk factor of HTN, HF and Afib (consensus)